lived on, in spite of his terrible affliction, devoted to his work, developing his theories, and putting them to practical use in the treatment of disease. For some time past he had been confined to his house, and could only direct the labours of others in the great Light Institute at Copenhagen. His death occurred on Saturday, September 24, at the early age of forty-three.

Niels R. Finsen was born in the Færoë Isles, and spent some of his earlier years in Iceland. After eight years' study at the University of Copenhagen, he was appointed lecturer on anatomy. But his attention was soon directed to the investigation of the influence of light on living organisms.

Starting from Widmark's observations on the inflammation of the skin caused by the ultra-violet rays of light, he developed in 1893 the red-light treatment of small-pox. The exclusion of the chemical rays by red curtains modifies the course of this disease, and diminishes scarring. A prolonged series of observations was then made on the influence of light upon various animals, proving that the chemical rays produce irritative and deleterious effects.

Later, Finsen investigated in a masterly manner the bactericidal power of the ultra-violet rays, a development of the work of Downes and Blunt. The practical application of these experimental researches was the treatment of lupus by light, an advance in therapeutics which has placed in the hands of the medical profession a means of combating this intractable and most disfiguring disease.

Fortunately, Finsen's work was not allowed to languish for want of financial support. His friends helped him, and then the State aided him with a loan, free of interest, and the Light Institute was built. Since it was opened, 2000 patients have been treated.

The interest taken by Queen Alexandra in the work of her countryman led to the introduction of the light treatment into this country, and her gift of the apparatus to the London Hospital was followed by generous assistance from private donors enabling that institution to carry out the Finsen treatment with remarkable success.

Finsen was a man of noble qualities, of high scientific attainments, and of a remarkably inventive mind. The construction of his apparatus is sufficient to indicate this. It was no chance discovery, but was laboriously built up by the adaptation of scientific principles. His modesty, quiet humour, and total absence of self-seeking brought him the esteem and affection of all who knew him.

Always a poor man, Finsen could with difficulty be persuaded to retain for the use of his family any part of the Nobel prize of 100,000 crowns which was awarded him. He wanted to give all to his institute, but eventually agreed that half should be placed at interest for his family, to revert subsequently to his great work. This institute and its beneficial cures are a fitting memorial of a splendid life of quiet heroism in the cause of science.

NOTES.

A CAREER of high promise was cut short by a lamentable accident at the "Devil's Kitchen," near Bethesda, North Wales, on September 20. Mr. Ronald William Henry Turnbull Hudson, lecturer in mathematics at the University of Liverpool, who, with Mr. J. F. Cameron, lecturer of Caius College, Cambridge, was climbing a difficult *couloir*, dislodged a mass of rock, and, falling with it, was instantly killed Mr. Hudson, who was just twenty-eight years of age, was the son of Prof. W. H. H. Hudson, of King's College, London, and the brother of two sisters who recently distinguished themselves in mathematics at Newnham College. He was educated at St. Paul's School and St. John's College, Cambridge. He gained every college award that was open to him, and graduated as senior wrangler in 1898, his friend Mr. Cameron being second wrangler. The two comrades were alone in the first division of the first class in part ii. of the tripos in 1899, and in the following year each was a Smith's prizeman. In 1900 Mr. Hudson was elected a fellow of his college, and engaged with success in teaching and research. He graduated M.A. in 1902, and was appointed lecturer at Liverpool, where his powers rapidly matured. He published a number of papers, chiefly on analytical and geometrical subjects, which manifested much freshness and skill, as well as width of interest and of knowledge. He was unusually well read in classical and modern literature, and in experimental science. In athletic pursuits he was also keenly interested, and more than once steered his college boat to victory. It was confidently expected that ere long he would be promoted to a professorial chair, for which his gifts and acquirements specially fitted him. The news of his untimely death was received in Cambridge with the deepest regret, and with sincere sympathy for his family and college.

THE fifth annual Huxley memorial lecture of the Anthropological Institute will be delivered on Friday, October 7, in the theatre of the Civil Service Commission, Burlington Gardens, when Dr. J. Deniker, of Paris, will lecture on the different racial elements in the present population of Europe.

THE King has conferred the title "Royal" upon the Edinburgh Museum of Science and Art, and approved its designation being altered to "The Royal Scottish Museum."

EXTENSIONS made to Millport Marine Biological Station, including new laboratory, research rooms, tank-room, and library, all the gift of Mr. James Coats, jun., of Paisley, were opened on Tuesday by Sir John Primrose, Lord Provost of Glasgow.

THE Liverpool School of Tropical Medicine proposes to dispatch a second expedition to the Amazon in view of the necessity of further investigation of yellow fever. The expedition will probably start at the end of this year.

THE National Association for the Feeble-minded and the National Union of Special School Teachers have arranged a conference to be held at the Guildhall on October 13 and 14 to discuss various aspects of physically, mentally, and morally defective children.

REUTER'S correspondent at Naples states that the Vesuvius Observatory has issued the following notice:—"The activity of Vesuvius is very great. The walls of the crater, which have collapsed, tend to obstruct the bottom of the crater, whence proceed immense explosions and volcanic dust. The torrent of lava in the valley of Atrio del Cavallo is forming small volcanoes, the explosions from which attain a height of 150 metres. Large fissures have occurred in the great cone, the rupture of which is considered possible." The eruption of Mount Vesuvius on September 23 is said to have been the greatest within the last ten years. On September 25 explosions were frequent, and masses of igneous matter were hurled to great heights. Parts of the neighbouring woods have been burned, the funicular railway has been damaged, and the guides' quarters have been destroyed.

The following papers will be read at the autumn meeting of the Iron and Steel Institute to be held in New York on October 24 and 26:—Iron and steel at the St. Louis Exposition: Prof. H. Bauerman; a West African smelting-house: C. V. Bellamy and F. W. Harbord; the influence of carbon and phosphorus upon the strength of iron and steel: H. H. Campbell; the Rateau low-pressure turbine at steel-works and collieries: E. Demenge; a dry air blast apparatus: J. Gayley; high-speed tool-steels: J. M. Gledhill; the determination of carbon and phosphorus in steel: Baron H. Jüptner von Jonstorff, A. A. Blair, G. Dillner, and J. E. Stead, F.R.S.; acid open hearth manipulation: Andrew McWilliam and W. H. Hatfield; a power gas plant for Johannesburg: P. J. Mallmann.

The fourth general meeting of the International Fire Service Council was recently held at Budapest on the occasion of the International Fire Congress, which was organised under its auspices. The meeting was presided over by M. G. de Marie, of Luxemburg. All the European countries were represented, with the exception of Portugal, Turkey, and the Balkan States. It was decided that the seat of the council remain at Luxemburg for the next four years. Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, was re-elected vice-president for the impending four years. The work of the council for this period will deal to a considerable extent with technical questions, with statistical questions in respect to fire losses, and with the preparation of a fire technical dictionary in the German, French, and English languages. The next general meeting of the council will be held at Milan in 1906. Among the resolutions adopted by the recent conference at Budapest were the following:—(1) That it is absolutely essential that all stage scenery and properties be rendered non-inflammable in a trustworthy and permanent manner, and that all the constructional parts of a stage be of a fire-resisting character. (2) That the greatest attention should be accorded to the chemistry of fire protection in the interests of fire prevention.

The twelfth annual report of the Sonnblick Society for the year 1903 contains a very interesting description by Dr. O. Szlavik, an assistant at the Vienna Meteorological Office, of a winter passed by two observers and himself on the summit of that mountain, at an altitude of 10,190 feet above the sea. For various reasons, including the want of educated companions and the difficulties of locomotion, Dr. Szlavik considers that a winter passed at such a station compares unfavourably with the privations endured at a Polar station. The meteorological summary for 1903 shows that the mean monthly temperature only rose above the freezing point in the month of August. The maximum (46°.8) occurred in September, and the minimum (−14°.4) in February. Snow or rain fell on 205 days. The pamphlet also contains an illustrated article on optical phenomena observed at the station, the results of observations at several high-level stations in the neighbourhood of the Sonnblick, and other useful information relating to mountain meteorology. We are glad to learn that the society has decided to combine the results of the last twelve years in one handy volume.

The *Journal* of the Sanitary Institute for August (xxv., part ii.) contains the addresses delivered to the congress of the Sanitary Institute at Glasgow, and Sir Douglas Powell's lecture to the congress on "The Prevention of Consumption."

We have received the September number of *Our Hospitals and Charities*, an illustrated monthly journal which gives interesting particulars of the various London and provincial hospitals, convalescent homes, and other charitable institutions.

Several papers have recently been published on the morphology and occurrence of the Leishman-Donovan body or parasite (see Nature, lxix. pp. 167 and 495, and lxx. p. 85). This parasite occurs in certain cases of irregular tropical fever of long duration, associated with enlarged spleen and marked cachexia. Major Donovan, I.M.S., in the *Lancet* (September 10, p. 744) describes fully the cases in which he has detected the parasite, and gives a number of coloured drawings of the latter. In the *British Medical Journal* (September 17, p. 642) the discussion on this parasite at the meeting of the British Medical Association is reported. Major Leishman, R.A.M.C., in opening it, stated that he had expressed the opinion that this parasite was a stage in the life-cycle of a flagellate protozoon, probably a trypanosome. Prof. Leonard Rogers described experiments he had performed on the cultivation of the organism, and stated that undoubted trypanosomes had appeared in two of his cultures.

The report of the departmental committee appointed to investigate experimentally and to report upon certain questions connected with the dipping and treatment of sheep has recently been issued. The composition of efficient dips, their method of use, and their effects upon the animals, the wool, and the parasites for which they are employed, and the life-history of the sheep-scab acarus and other parasites, are some of the subjects dealt with, and a series of recommendations is given for the periodical dipping of sheep. All the dips tested proved efficient; they consisted of arsenic and alkali, arsenic and sulphur, preparations of tar, tobacco and sulphur, and carbolic acid. The tobacco and sulphur preparations seemed to be the most active, rapidly killing the parasites, and having no injurious action on the wool; they are, however, somewhat costly. The arsenical preparations have to be used with care, or the animals may suffer. Some of the tar preparations had a deleterious action on the wool.

In the *Bulletin* of the Johns Hopkins Hospital for July (xv., Nos. 160–161), Dr. Harvey Cushing surveys the sensory distribution of the fifth cranial nerve, Dr. Percy Dawson continues his biography of the Rev. Stephen Hales, and Dr. Schmoll discusses the chemical origin of leucocytes. In the last named the question is discussed whether the organism is able to synthesise the nuclein of its tissue cells, or is obliged to build them out of the cell material contained in its food. From a study of cases of leucæmia, and the influence on the leucocytes of ordinary mixed diet and of a purin-free diet, the conclusion is arrived at that, while the organism prefers to draw upon preformed nuclein material, it is perfectly able to synthesise this if necessary.

Dragon-fly "nymphs" form the subject of a paper by Mr. J. G. Needham published in the *Proceedings* of the U.S. National Museum (No. 1371). The examination of a large series of the immature stages of these insects has tended to throw light on the mutual relationships of the forms to which they severally belong.

Considerable interest attaches to an article by Messrs. Castellani and Willey in the August issue of *Spolia Zeylanica* on the parasites found in the blood of vertebrates in Ceylon. The only trypanosome detected by the authors in the island is *Trypanosoma lewisi*, which infests at least 25 per cent. of the rats in millions, but without doing any appreciable harm to its hosts. Although the trypanosome of cattle disease can be readily transmitted by inoculation into rats, the rat-parasite will only develop in its proper hosts. Some curious problems in development are presented by the life-history of a gregarine found in the blood of a water-snake.

In the September issue of the *American Journal of Science* Mr. E. H. Sellards continues his account of the Palæozoic cockroaches, with descriptions of several new Coal-measure types. Another article, by Mr. G. R. Wieland, is devoted to the structure of the turtles of the genus Lytoloma, as exemplified by specimens from the Upper Cretaceous of New Jersey. These turtles, it may be mentioned, are characterised by the backward position of the inner nostrils and the great length of the mandibular symphysis. The author considers that they were specialised for the purpose of feeding on shell-fish, and confirms Mr. Lydekker's reference of the English Eocene *Chelone planimentum* to the American genus.

Drs. B. L. Robinson and J. M. Greenman continue to publish the results of their examination of Mexican and Central American plants in the first number of the current volume of the *Proceedings* of the American Academy of Arts and Sciences. Mr. M. L. Fernald presents a synopsis of species of Alnus, and describes a number of new species from the same countries.

It is tolerably well known that contact with certain plants, notably species of Rhus and Primula, often causes inflammation. This may be described as a form of eczema, or in some cases would be more correctly called dermatitis. Mr. J. H. Maiden has made these plants the subject of a short paper which he laid before the Therapeutical Society in March, 1903.

Since the first description with figures of Melocanna by Roxburgh in 1819, it was known that this genus of bamboos growing in eastern Bengal and Burmah was characterised by the production of a succulent fruit about the size of a pear, and containing one large oval seed; later it was observed that germination started before the fruit was shed. Only recently has a complete description been forthcoming in the paper which Dr. O. Stapf communicated to the Linnean Society, and which is published in the *Transactions* (June). The fruit of Melocanna differs from that of ordinary grasses in other respects, because the ripe seed contains no endosperm, the food being stored up in the pericarp, and the collapsed endosperm cells act as a diaphragm. One of the most striking features of the plant is that it forms large jungles or forests, in which after many years of vegetative growth all the plants produce their flowers and fruits simultaneously.

In view of the discussion of electrical units by the International Electrical Congress at St. Louis, the Physikalisch-Technische Reichsanstalt publishes in part xxxi. of the *Elektrotechnische Zeitschrift* a protest against defining the unit of electromotive force by reference to a standard cell. It is maintained that sufficiently large differences exist in the E.M.F. of any one type of cell with differences in constructional detail to prevent the adoption of such a unit from giving satisfaction. With our present knowledge of standard cells, it is contended, the unit of resistance should be the mercury unit, and current should be defined by reference to the silver voltameter; the unit of E.M.F. is then the derived unit obtained by assuming Ohm's law.

We have received from the author a reprint of a paper read before the German Physical Society by Mr. L. Austin on the alteration in length during magnetisation of Heusler's magnetic alloys of manganese, aluminium, and copper. It contains a description of a very simple apparatus for measuring minute changes in length, in which the magnifying principle adopted is the reflection of a beam of light from a plane mirror. Besides showing that the alloys increase in length during magnetisation proportionally to the magnetic force, the author describes a peculiar contraction which they subsequently undergo when exposed to a magnetic field of constant strength. The contraction seems to be roughly proportional to the square of the magnetic intensity.

In No. 18 of the *Physikalische Zeitschrift* Prof. F. Paschen publishes an experimental investigation of the γ rays emitted by radium. These extremely penetrating radiations have hitherto been regarded as most closely allied to the Röntgen rays, but as they carry with them a negative charge which they are capable of imparting to substances that they encounter, it appears more justifiable to regard them as a species of kathode rays. All attempts, however, to deflect the γ radiations in the same way as the β rays by means of an intense magnetic field were unsuccessful. Even in a field of 30,000 C.G.S. units a perceptible deviation from a straight line path could not be detected. By carefully measuring the thermal effect of the γ radiations, the surprising result was obtained that the energy of a γ electron must be at least 3200 times greater than that of a β electron. That the γ rays cannot be the Röntgen effect of the β or kathode rays of radium is shown by the fact that their total energy is to that of the β rays in the ratio 74 : 1. It is concluded, indeed, that the γ rays carry with them the greater proportion of the energy of radium.

An improved means of observing the beautiful scintillations exhibited by a sensitive screen under the action of Alpha rays has been devised by Mr. F. H. Glew, 156 Clapham Road, S.W. The little instrument, which is called the "Scintilloscope," consists of a simple magnifier of adjustable focus, as in the spinthariscope, but instead of the fixed screen and particle of radio-active substance a small double plate of glass is used. One of these pieces of glass is coated with a radio-active salt, and the other is a radio-sensitive screen. Upon looking at a combination of this kind with the lens the sparkling appearance is very clearly seen. The advantage of this method of observing the effect is that different combinations of radio-active substances and screens can be used. For instance, a sensitive screen placed upon a piece of pitchblende ground flat and polished shows the scintillations very well. Mr. Glew's device provides an effective way of exhibiting the brilliant display produced by radio-activity on sensitive screens.

In the *Proceedings* of the American Philosophical Society (vol. xliii. p. 123) Messrs. Edgar F. Smith and F. F. Exner give an account of an elaborate investigation of the atomic weight of tungsten. The authors, on the basis of a critical examination of previous determinations, consider it doubtful whether pure substances have been employed. The mean atomic weight calculated from concordant data obtained by converting the hexachloride into the oxide is 184·04, and by oxidation of the metal 184·065.

Some interesting results have been obtained by F. Garelli and F. Gorni in a study of the isomorphism of organic substances by the cryoscopic method. They are described in the August number of the *Gazzetta*. Substances may apparently differ very considerably in constitution, and yet crystallise together so as to form a solid solution. Thus, for example, phenyl benzoate, phenyl salicylate, and salicylhydroquinone, which differ by the important hydroxyl group, readily form mixed crystals. That a definite law does not hold in such cases is shown by the fact that phenol and hydroquinone, which bear the same relation to each other as phenyl salicylate and salicylhydroquinone, are not perceptibly isomorphous. The results are of importance as indicating a limitation of the cryoscopic method of determining molecular weights.

SOME experiments which are of importance from the standpoint of the theory of dyeing are described in the *Proceedings* of the Vienna Academy of Sciences (No. 15) by Prof. W. Suida. On exposing several finely divided natural silicates to the action of coal-tar dyes, it was found that those silicates which were of an acid nature, containing free hydroxyl groups, were permanently dyed by the basic dyes of this series, whilst acid dyes were without action. Similarly, hydrated silicic acid readily absorbs the same colours, whilst silicic anhydride has no affinity for them. When kaolin is used, the different colour-bases combine with it in equivalent proportions, probably to form colour-salts, the original acid in the dye becoming attached to constituents of the clay. Similar results were obtained with potato-starch, and the general conclusion is drawn that the process of dyeing with basic colours is far more chemical than physical in its nature.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN OCTOBER :—

Oct. 1. 7h. Mercury at greatest elongation, 17° 54′ W.
5. 7h. 45m. to 9h. 7m. Transit of Jupiter's Sat. III.
7. 15h. Moon in conjunction with Mercury. Mercury 1° 1′ N.
12. 11h. 0m. to 12h. 24m. Transit of Jupiter's Sat. III.
15. Venus. Illuminated portion of disc=0·897, of Mars=0·956.
18. 11h. 0m. Jupiter in opposition to the Sun.
19. 14h. 13m. to 15h. 42m. Transit of Jupiter's Sat. III.
19–21. Epoch of October meteors (Radiant 92°+15°).
19. 10h. 8m. Minimum of Algol (β Persei).
22. 6h. 57m. Minimum of Algol (β Persei).
23. 10h. 0m. Moon in conjunction with Jupiter. Jupiter 1° 34′ N.
25. 6h. 37m. Jupiter's Sat. IV. in superior geocentric conjunction.
26. 16h. 48m. to 17h. 25m. Moon occults γ Tauri (mag. 3·9).

EXPLANATION OF THE MARTIAN AND LUNAR CANALS.—Prof. W. H. Pickering, writing to No. 7, vol. xii., of *Popular Astronomy*, offers an explanation of the formation and variation of the Martian canals which is based on their analogy to the similar features seen on the lunar surface. Whilst accepting the vegetal origin so ably supported by Mr. Lowell, Prof. Pickering finds the theory of artificial pumping suggested by that observer difficult to realise.

Instead of this, he supposes that the lunar canals, and hence, by analogy, those observed on Mars, are simply lines of volcanic action on the surface where the crust is weakened, and therefore is easily cracked by the internal stresses put upon it by the action of the heated interior.

This theory is supported by his observations that the canals, and also the lakes from which they appear to radiate, are dotted by small craterlets and are so symmetrically arranged about the craterlets as to suggest a causal relation between the two phenomena. Analogous formations are common in terrestrial volcanic districts; for example, in the 2000 mile stretch of volcanoes which occurs in the Andes.

This theory does not require the transference of water and carbon dioxide along the canals, but supposes that they issue directly from the interior along the whole length of each fissure, and in conjunction with sunlight promote the growth of vegetation. Owing to the rarity of the atmosphere, Prof. Pickering suggests that the vapours would not ascend on their emergence, but would quietly roll down the slopes of the craterlets, or "lakes," and canals, thereby sufficiently irrigating the immediate vicinity to produce the vegetation.

FURTHER OBSERVATIONS OF THE RECENT PERSEID SHOWER.—Communications from American observers confirm the comparative richness of the recent display of Perseids.

At Wilmington (N.C.) Mr. E. S. Martin saw between 25 and 30 Perseids per hour between 9 p.m. and 12 p.m. (local M.T.) on the nights of August 10 and 11, although very few were seen on August 12 and 13, and none on August 14.

At Barre (N.Y.) Mr. W. Wetherbee saw 154 meteors, of which 116 were Perseids, in less than three hours on the eve of August 11. He remarked that many of the Perseids appeared in pairs the components of which travelled in parallel paths and had equal magnitudes. According to this observer, the radiant has moved westward, and appeared to be near to the star ι Persei. One extraordinarily bright Perseid appeared in Aquila, and left a trail 10° long which lasted for about four minutes (*Popular Astronomy*, No. 7, vol. xii.).

POSITION OF SATURN'S NINTH SATELLITE.—A telegram from Prof. E. C. Pickering, published in No. 3969 of the *Astronomische Nachrichten*, announces that Prof. Barnard observed Phœbe, Saturn's ninth satellite, on September 12·6916 (G.M.T.). The apparent position at that time was as follows :—

$$\alpha = 21\text{h. } 12\text{m. } 29{\cdot}5\text{s.}, \quad \delta = -17^\circ\ 25'\ 55''.$$

The motion of the satellite was south-west, whilst the magnitude was 16·7.

DISTRIBUTION OF NEBULÆ IN RELATION TO THE GALAXY.—In No. 3969 of the *Astronomische Nachrichten* Dr. C. Easton discusses the distribution of the nebulæ in regard to the galactic system.

Commencing with the usually accepted statement that the nebulæ not only occur some distance from the Milky Way, but that they actually tend to congregate about the galactic poles, he confirms this, from observational data, for the northern hemisphere, but questions its truth for the southern hemisphere. He further states that the accepted notion that it is simply the lack of observations which accounts for the apparent scarcity of nebulæ in the southern hemisphere is not founded on fact. If it were true, then that part of the northern galactic zone which lies south of the equator should apparently contain fewer nebulæ than that part which is above, because it has not been so well observed. The following figures show that although this is true for the faint nebulæ, which with the planetary nebulæ are placed in the category of "green nebulæ," in the case of the bright (*i.e.* "white") nebulæ the inverse is true :—

Northern Galactic Zone.

	A S. of the equator	B N. of the equator
Faint nebulæ	754	1043
Bright nebulæ	152	71

This leads to the conclusion that the nebulæ in the southern hemisphere are not arranged in the same manner as those in the northern.

Several other interesting points are developed by Dr. Easton in his paper, and are supported by the tabulated observational results which he gives. One other important conclusion at which he arrives is that the faint nebulæ are allied, as regards their phase of development, to the stellar conglomerations of the galaxy and occur in the same regions, whilst the bright (*i.e.* "true") nebulæ are similarly allied to the sparsely distributed non-galactic stars.

ASTRONOMY AND COSMICAL PHYSICS AT THE BRITISH ASSOCIATION.

GREAT vitality was shown in this subsection, and three mornings and one afternoon were hardly sufficient to get through the rather large programme. The meetings were well attended, and were of particular interest, since many distinguished foreigners were present, several of whom attended at Cambridge in consequence of the meeting there of the subcommittee of the International Meteorological Committee which was appointed at Southport last